REMARKS

The Examiner will note that claims 1, 2 and 3 have been amended by incorporating the formula of claim 4 into claims 1, 2 and 3. In addition, original claim 16 has been made into two dependent claims to provide appropriate antecedent basis for "petroleum oil" vs. "lubricating oil".

In the Advisory Action dated July 21, 2003 (paper no. 9), the Examiner stated that both the Velenyi and Sawyer references suggest or disclose the components of the catalyst composition used in the process of the instant application. The Examiner has previously cited Sawyer, page 4, lines 19-25 as teaching a first hydrotreating catalyst comprising at least one Group VIB and at least one non-noble Group VIII metal on a refractory oxide support to produce a first hydrotreated feedstock. The Examiner acknowledges that Sawyer does not disclose a process wherein the hydrotreating catalyst comprises a bulk metal catalyst comprising at least one non-noble Group VIII metal molybdate in which at least a portion but less than all of the molybdenum is replaced by tungsten. The Velenyi reference was cited as disclosing a bulk metal catalyst represented by the formula $Mo_aW_bM_cA_dO_e$.

With regard to the point that Sawyer and Velenyi disclose the components of the catalyst used in applicants' process, there is nothing in the combined teachings of Sawyer and Velenyi to lead one skilled in the art to catalyst of amended claims 1-3.

First, Sawyer teaches the preparation of supported catalysts. There is no teaching on how to prepare unsupported catalysts in Sawyer, and applicants' catalysts are by definition unsupported (page 23, lines 10-11). They are not

prepared by the conventional techniques of impregnating a carrier with the desired metal. Second, in the catalyst taught by Velenyi (Abstract), M is selected from the group consisting of one or more metals selected from any of Groups IB, IIB, IVB, VB or VIII and/or one or more of Y, Cr, Mn, Re, B, In, Ge, Sn, Sb, Th or U. A is at least one metal selected from the group consisting of alkali metals, alkaline earth metals, Lantanide series metals, La, Tl or mixtures thereof. In order for the Examiner's assertion that Velenyi discloses the components of the catalysts used in applicants' process, one must first assign "d" (in the Velenyi formula) a value of zero. Next, one must assign "c" a non-zero value and then select "M" to be non-noble Group VIII metal from the extensive list of metals given by Velenyi. Then one must determine applicants' ratio of b:(c+d), which is from 0.5/1 to 3/1. In Velenyi, "c" is a number such that the ratio of c:(a+b) is from 0:100 to 10:100.

A further factor is that the use taught by Velenyi (see Abstract) is for converting gaseous reactants comprising methane and oxygen to higher order hydrocarbons using the catalyst described in the Abstract. There is nothing to guide one skilled in the catalyst art to apply Velenyi to applicants' process.

Catalysts have long been recognized as unpredictable by both the Courts and the Board of Appeals (In re: Doumani, 126 USPQ 408 (CCPA, 1960), Ex parte Berger, 108 USPQ 236 (POBA, 1956). In the Doumani case, the Groll patent at issue listed a wide variety of metals and metallic compounds suitable for use as catalysts, with more than thirty metals being specifically named as examples. Merely because both Pt and Rh were included in the Groll list did not, in the opinion of the CCPA, necessarily establish any close relationship between them or indicate a likelihood that they would be generally equivalent as catalysts.

Because the catalytic art is unpredictable, there is no way for one skilled in the art to predict what reactions various subsets of Velenyi components might catalyze other than the stated use set forth in the Velenyi disclosure. The silence of Velenyi as to other uses will not lead one skilled in the art to the catalyst of amended claim 1. This is particularly true for the Velenyi catalyst which is stated to be used for converting methane and oxygen to higher-order hydrocarbons. This reaction is oxidative (col. 9, lines 12-47) and it is unlikely that one skilled in the art would look to oxidative catalyst processes as oxygen in a hydrotreating process raises serious safety concerns.

With regard to the issue of unexpected results, the x-ray diffraction pattern is evidence that the catalyst composition used in applicants' claimed process is unique. The difference between applicants' bulk catalyst and those obtained by co-mixing or conventional impregnation is discussed on page 36 of the specification. The process of Velenyi as exemplified in col. 11, line 47 et seq. and Table, cannot form the basis for any meaningful comparison with applicants' process as can be seen from the Velenyi feedstream (methane, nitrogen, air and water) and products (ethane, ethylene, CO, CO_2, and C_1 - C_3 oxygenated hydrocarbons). With regard to Sawyer, the catalyst of the Sawyer examples is a commercially available hydrotreating catalyst based on Ni/Mo. Comparisons between a conventional Ni/Mo catalyst and the present bulk metal catalyst may be found in Examples 5 (DBT conversion), 9 (HDN activity), and 20 (saturation and relative desulfurization activity).

Based on the preceding arguments and amendments, the Examiner is requested to reconsider and withdraw all objections and rejections and pass this application to allowance. The Examiner is encouraged to contact applicants' attorney should the Examiner wish to discuss this application further.

Respectfully submitted:

Date: 3 September 2003

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